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# OFFICIAL PROCEEDINGS

Meeting of April, 1921

Volume XX.
No. - - - 4
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INCORPORATED OCTOBER 1913

# Canadian Railway Club

MONTREAL

## CONTENTS

REPORT OF APRIL MEETING

also

PAPER AND DISCUSSION

"SOME SIDELIGHTS ON RAILWAY TIME TABLES."

**TUCO PRODUCTS CORPORATION.**
Passenger Car Specialties—National Standard Roofing—Tuco Flexolithe Composition Flooring—Trap Doors "National" and "Universal"—Window Screens "Imperial" and "Universal"—Insulation "Tucork" and "Resisto."

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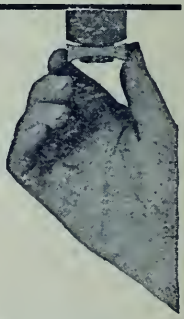

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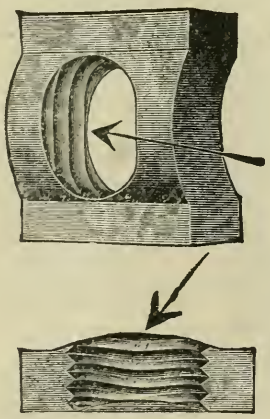

This cut shows an exaggerated curve in thread pitch.

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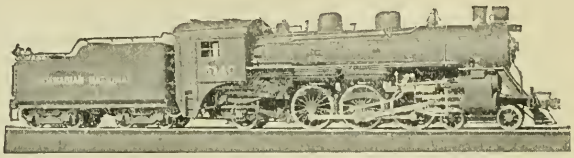

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Diameter of drivers, 69 inches
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Cylinders, 23½ x 28 inches
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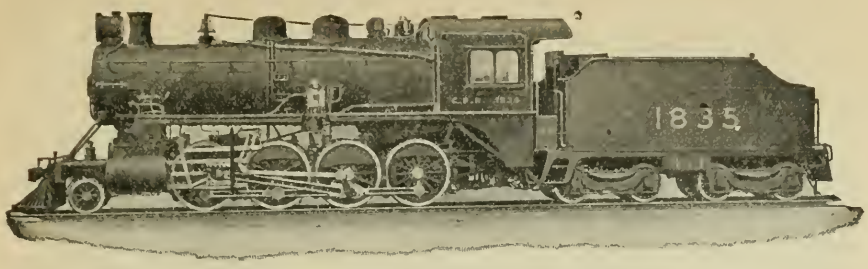


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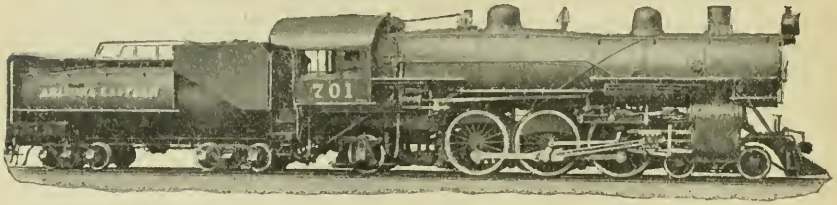


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W. A. BOOTH, Secretary, 53 Rushbrooke Street, Montreal.

Vol. XX. No. 4 **Montreal, Can., April 12, 1921** 25c. per copy

# PROCEEDING OF THE CANADIAN RAILWAY CLUB.

Windsor Hotel, Montreal,
April 12th, 1921.

Chairman:

Gentlemen, will you please come to order, and will everybody sign one of the cards which you will find on the seats, in order that we may have a record of the attendance to-night. I should like to announce that the minutes of the previous meeting are not yet off the press, but they will probably reach you some time this week. The written discussion has been added to these minutes and the whole proceedings on the subject of maintenance of steel freight cars form a very valuable contribution to our library. The paper and its discussion comprise a valuable treatise on this subject, and I believe it will be referred to as a source of information for many months to come. The Secretary will now read the list of applicants for membership.

Secretary:

Mr. President and gentlemen: The following applications have been received since our last meeting.

## New Members.

Boulay, T., Yard Master, C. N. Rlys., Joliette, Que.
Brooks, C. E., Mech. Asst. M. P. Dept., Can. Nat. Rlys., Toronto, Ont.
Connolly, A. J., Supt.. Union Freight Railroad, Boston, Mass.
Cooper, A., Chief Clerk M. P. Dept., G. T. R., Coteau.
Coplan, A. H., Pres. and Man. Dir., Hull Iron & Steel Fdy., Hull, Que.
Crook, C., Chief Timekeeper, G. T. R., Montreal.
Davey, F., Car Foreman, C. P. R., Hochelaga.
David, C., Asst. Road Foreman of Engines, C. V. Rly., St. Albans, Vt.
Davidson, M. W., Mech. Engr., George Foss Machinery Co., Montreal.

Deardon, G. A., Night Foreman, G. T. R., Coteau.
Deubelbeiss, H. S., Asst. Engr., C. P. R., Montreal.
Fegan, S. H., Boiler Inspector, G. T. R., Belleville, Ont.
Fitzmaurice, R. D., Gen. Supt., N. Y., N. H. & H. Rld., Boston, Mass.
Fulton, J., Clerk, G. T. R., Montreal.
Gigg, T., Signal Maintainer, G. T. R., Montreal.
Goodman, F. C., Draftsman, C. P. R., Montreal.
Gutteridge, D. S., Draftsman, C. P. R., Montreal.
Hanson, L. J., Signal Supervisor, G. T. R., Montreal.
Johnson, R., Locomotive Foreman, C. P. R., Montreal.
Ketterson, A. R., Asst. Engr., C. P. R., Montreal.
Kidd, A. J., Signal Draftsman, C. P. R., Montreal.
Lecavalier, L., Asst. Car Foreman, C. P. R., Montreal.
Martin, T., Engineer, C. P. R., Montreal.
Miller, A. G., Locomotive Engr., G. T. R., Montreal.
McCormick, J. A., Draftsman, C. P. R., Montreal.
O'Connor, A. P., Asst. Chemist, Can. Car & Fdry. Co., Montreal.
Phillips, G. L., Loco. Engineer, G. T. R., Montreal.
Playfair, J., Foreman, G. T. R., Montreal.
Robertson, R. M., Draftsman, C. P. R., Montreal.
Robinson, J. N., Sec., Canadian Welding Society, Toronto.
Stacey, F. H., Salesman, Canadian Allis-Chalmers, Montreal.
Thomson, W. C., Asst. Engr., C. P. R., Montreal.
Vernon, B., Principal Asst. Engr., Montreal Tramways, Montreal.
Wallace, A. M., Charge Hand, G. T. R., Coteau Junction.
Woodward, J. W., Draftsman, C. P. R., Montreal.

Chairman:

Gentlemen, you have heard the list of applicants for membership. This is a pretty good showing considering the number of applications we had at last meeting, and indicates the interest that the members of this club are taking in its welfare. A motion of acceptance of these applications will be in order.

Mr. James Powell:

I would move that these applications be accepted.

Mr. W. C. Hunter:

Seconded.

Chairman:

It has been moved and seconded that these applications be accepted. Are all in favor?

Carried.

## Members Present.

Winterrowd, W. H.
Allan, C. D.
Ayers, J. R.
Bailey, L. E.
Baldwin, G. E.
Battley, E. R.
Benger, F.
Besse, R.
Bird, H.
Blaiklock, H. M.
Blumenthal, S.
Boughton, L.
Brady, L. P.
Branston, W.
Britton, J. H.
Brown, B.
Brown, L.
Brooks, P. A.
Buchanon, R. G.
Buckland, A. W.
Buckland, J. W.
Burke, J. M.
Burns, J.
Butler, A. J.
Camp, W. J.
Chown, T. C.
Clarke, J. B.
Cleary, L. A.
Clibbon, A. T.
Coleman, G. T.
Coleman, M.
Collier, R.
Collins, T.
Crawford, R.
Crowhurst, W. H.
Crumpton, A.
Culkin, R.
Daird, C. H.
Desfaroise, D.
Dickenson, T. E.
Duclos, L. M.
Duggan, H. I.
Ferguson, F.
Forbes, J.
Fradd, F. J.
Fulton, J.
Gardner, K.
Geldart, C.
Gray, C. N.
Hamer, T. M.
Hamm, W. C.
Hampshire, A.
Hanson, L. J.
Hartney, J.
Hebert, C.
Hellyer, Geo.
Hendry, J.
Hogan, T. H.
Horwood, H. E.
Holland, R. F.
Hudson, G. F.
Hudson, H.
Hunter, W. C.
Ironside, W. C.
Kendall, A. H.
Kenny, J. P.
Kinnear, C. R.
Kurfess, L. S.
Langlais, W. L.
Lowe, W. S.
Luscombe, H.
Main, H. J.
Malcolmson, H T.
Marshall, T. M.
Mimms, A. E.
Miller, A. G.
Milne, D.
Morrison, W. W.
Moore, E. T. W.
Moore, T. H.
Morgan, W.
Morris, A.
Mynard, T.
McAllister, W. J.
McAlpine, J. H.
McDonald, D. M.
McGoldrick, F. J.
McHattie, T.
McLachlan, J.
McNown, W. L.
McVicar, R.
Nicholson, L. G.
Normandin, M. L.
Normandin, R.
O'Brien, E. G.
O'Donnell, M. J.
Ostrander, W.
Parsley, W. H.
Paxton, J. D.
Peacock, R. W.
Peterson, W. A.
Phelan, W.
Phillips, G. L.
Pierpoint, F. H.
Powell, J.
Prendergast, J.
Pringle, J. F.
Prowse, W.
Robertson, J.
Rose, E.
Ross, J. D.
Ross, N. E.
Smith, E. D.
Spalding, E. C.
Spence, W.
Spry, S. H.
Stewart, T.
Taylor, H. C.
Tinkler, J. E.
Thorburn, C. D.
Uren, W. G.
Warnick, W. J.
Webb, W. C. H.
Wheatley, W. H.
Winterson, J. W.
Winship, R. B.

| | | |
|---|---|---|
| Workman, E. E | Yost, W. C. | Booth, W. A. |
| Wyer, F. H. | Young, W. H. | and others |

Chairman:

As you no doubt know, this is the last meeting of the club this year at which a paper will be presented. Our next meeting will be along the lines of our regular May meetings. There will be the Annual Report, the election of officers, and, afterwards, a "smoker" and entertainment.

It is customary at the April meeting for the President to nominate a Nominating Committee to make recommendations for officers for next year; also a committee for the "smoker" and concert. For the Nominating Committee I will appoint Messrs. Arthur Allan, T. C. Hudson, G. M. Wilson and J. A. Shaw. For the Smoking and Entertainment Committee I will name Messrs. N. Holland, E. D. Smith, J. D. Brandon, D. R. Arnold, E. B. Tilt and the Secretary, Mr. Booth. The Secretary will advise both these committees the dates on which they respectively will meet. I should like at this time to urge everyone to be present at the next meeting. The entertainment will, I can assure you, be quite up to the standard and a good time can be assured to all. I understand the "smoker" and concert will likely be held in the Rose Room of this hotel, which is the room in which we held our last meeting. Further announcement will be sent to you later.

The paper of the evening is entitled "Some Sidelights on Railway Timetables," by Mr. A. Hatton, General Superintendent Transportation, Canadian Pacific Railway. I do not believe that Mr. Hatton needs any introduction to you. I take great pleasure in asking him to read his paper. Mr. Hatton has asked me to say that he is suffering from the effects of a cold, which may interfere with his voice, but I have assured him that if he should break down there will be plenty of volunteers to take up the good work where he leaves off. We have here a large chart which explains in a very graphic manner how timetables are made. Mr. Hatton will refer to this chart while reading his paper.

## "SOME SIDELIGHTS ON RAILWAY TIME TABLES."

As a preface to the subject on which I have been asked to say something to-night, viz: "Some Sidelights on Railway Time Tables," I thought a little of the early history of transportation methods might not be inappropriate. Any account

of the interesting events attending the transition from the stage coach vehicle to the efficient transportation machine of to-day must, of necessity, be very fragmentary and disconnected, but I trust that if I touch here and there upon the various stages of development some connection may be shown between the past and the present.

In looking over the records of this development it would appear that the earlier devices were originated by the people solely for their personal use and comfort in moving from place to place, and it was not until there had been considerable expansion in the system for passenger conveyance that means were adopted for the transportation of freight.

In the early days the hour at which a traveller started on his journey could not be set with any degree of certainty, and the date of his arrival at destination was altogether a matter of chance. He was quite satisfied to get there, and a usual delay of a day or a week in going a hundred miles or so did not seriously bother him.

In this connection we might briefly refer to the stage coach period, when we are told they would leave a certain place on a certain day, and reach their destination in course of time, although I do find a time table for the London-Bristol service in the eighteenth century, showing a tri-weekly waggon leaving London Wednesdays, Saturdays and Fridays, arriving Bristol, Tuesdays, Fridays and Thursdays. I have been unable to figure out how long it was supposed to take to make the 120 mile journey, but evidently a passenger need not be in a hurry, for, according to the record, the coach travelled only during the day time, remaining for the night at some wayside inn, where, in coach language, "it slept."

On this side of the water travel at that time was very small, although, on account of the great distances and the newer country, the travellers' experience was more varied and often more thrilling, the prospect of losing a scalp adding zest to the other "comforts" of the trip.

The stage coaches were operated by private individuals, and in the course of time regular days were set for leaving the originating points and other places en route, and this tentative schedule was advertised to the public. As at present, more or less rivalry existed between the various carriers, who did not hesitate to criticize their rivals, and endeavor to set up a new record for fast time between points covered by their coaches.

On some of the routes, the Pioneer Stage Coach Companies adopted a rule which caused a considerable fluctuation in the rates passengers were charged for their transportation. This rule read as follows: "One hundred pounds weight will constitute a passenger and to be paid for accordingly, and a greater or less weight in proportion." It will be seen that if a traveller had the misfortune to weigh 150 lbs., he would, according to the regulations, constitute a passenger and a half, and would be compelled to pay for himself on that basis, and if he tipped the scale at 200 pounds, he then represented two persons as far as his ticket was concerned. Rate makers please take a tip.

To improve the stage coach transportation, and take care of the increased traffic, it was eventually decided to lay down wooden rails on which to run them, and to construct larger coaches or cars, mounted on small flanged wheels, and these were referred to as railroad cars. By this method one horse could haul a coach at a much greater speed than was possible over the highways then in use. Where a considerable hill obstructed the progress, the activity was surmounted by an incline plane up which the car or cars were pulled by a hawser. The cars were then let down the opposite side in the same manner.

The roadbed and tracks were constructed and owned by a corporation but could be used by any person operating a line of coaches.

In one of the early charters granted a corporation was included the following stipulation:

> "That a toll be granted for the transportation of passengers and property, the form of cars and carriages, the weight of loads, and all other matters and things in relation to the use of said road, and said road may be used by any person who shall comply with such rules and regulations."

Practically all of the lines were single tracked, of course, and the only provision made for the passage of cars in opposite directions was the building of so-called "turnouts." Half way between the turnouts a large pole was set up near the rails called a "centre post." When a car moving in one direction was met by another in the opposite direction short of one of these centre posts it was required to retreat to the last turnout in the rear. At the time this seemed to be the only practical scheme for deciding which should have pre-

ference, and numerous disputes and fights are said to have arisen through its operation. A driver would hesitate to get very far from a turnout—especially if the road was crooked and he could not see ahead for any distance—because he objected to returning, so he usually went very slowly until he got within sight of the goal, and then whipped up his horses in a frantic effort to attain the coveted position before he encountered any opposition. If a driver who was coming the other way pursued the same tactics the two cars would be driven madly towards each other, each trying to get to the centre post first, and sometimes they met with a crash that disabled the horses or injured their drivers or the occupants. On a few occasions men were even killed by collisions brought about under the circumstances described. At other times there would be pitched battles between the drivers or the contrary-bound travellers and considerable delays would necessarily ensue, much to the mental and physical anguish of the passengers.

This is what a newspaper has to say about the early horse-drawn railroad car:—

> "But the most curious thing is the railroad car. I must tell you there is a great trade between (blank) and the west. The western people buy a great many goods at (blank) and send in return a great deal of western produce. There is, therefore, a vast deal of travelling back and forth, and hundreds of teams are constantly occupied in transporting goods and produce to and from market.
>
> "Now in order to carry on the business more easily, the people are building what they call a "railroad." This consists of bars laid along the ground so that carriages with small wheels may run upon them with facility. In this way one horse will be able to draw as much as ten horses on a common road. A part of the road is already done, and if you choose to take a ride upon it you may do so.
>
> "You will mount a car something like a stage, and then you will be drawn along by the two horses at a rate of twelve miles per hour."

In an effort to improve the horse-driven car a new type of car was constructed, consisting of a coach upon which was placed a tall mast and sail. This contrivance was capable of developing a speed of ten to twelve miles per hour, if there

happened to be a sufficiently strong breeze from the right quarter. Without the right breeze it could not be used, and this scheme was, therefore, abandoned.

Then experiments were made with steam driven locomotives, but the impression made on the public was not favorable, and it is interesting to note what was thought of fast schedules.

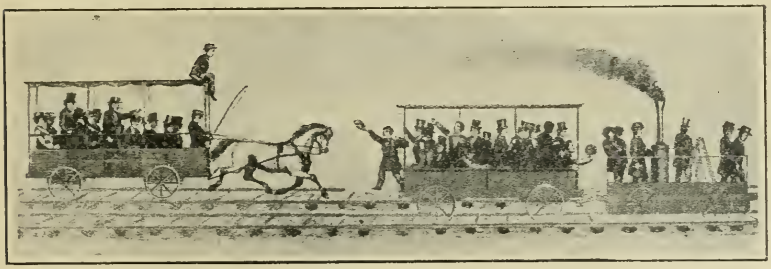
One account says:—"Carriages could not go at anything like the contemplated speed—if driven to it the wheels would merely spin on their axles and the carriages stand stock still." "Locomotives must always be objectionable on a railroad for general use where it is attempted to give them a considerable degree of speed. That any general system of carrying passengers could attain a velocity exceeding ten miles per hour or thereabouts is extremely improbable, and the idea of locomotives travelling twice as fast as stage coaches is preposterous."

In a leading English journal of November, 1835, railways are spoken of as new fangled absurdities and those in favor of them as dunces and blockheads, and it goes on to say:— "Does anybody mean to say that decent people, having their own carriages, and accustomed to comforts, would consent to be hurried along through the air upon a railroad from which, had a lazy school boy left a marble, they would be pitched off the perilous track into the valley beneath, or is it to be imagined that women would endure the fatigue and misery of being dragged through space at the rate of 20 miles per hour, their lives being at the mercy of a tin pipe or the accidental dropping of a pebble on the track? We denounce the mania as destructive to the country, the noise and stench of the steam engines will disturb the quietude of the peasant, farmer and gentleman ,and the roaring of bullocks, bleating of sheep and grunting of pigs keep up one continuous uproar through the night along the lines of these most dangerous and disfiguring abominations. If tho railroads succeed they will give an unnatural impetus to society, destroy relations between man and man, overthrow all mercantile regulations, overturn markets, drain the provinces of their resources, and create, at the peril of life, all sorts of confusion and distress."

There were somewhat similar protests made elsewhere, but opposition was gradually worn down, and then, suddenly, interest in the new creation was manifest on every hand, and strange to say, all sorts of methods were adopted to bring the railroad prominently to the fore. Metallic discs were struck

off in honor of its arrival, crude representations of locomotives and cars appeared as decorative patterns on dishes, china and glassware used by the people. The popular sheet music was occasionally embellished with pictures of steam engines and cars, and even whiskey bottles appeared bearing upon their sides designs and inscriptions commemorating the introduction of railed tracks.

The stage coach owners began to get dismayed, believing their business menaced, and one of the largest firms resolved to challenge the mechanical contrivance, and, if possible, demonstrate its inferiority as a vehicle of travel. So when the next engine and coach was sent out to the end of the road a horse drawn car was also sent out to the same point on the second track —(there were two parallel tracks between these points) for the purpose of racing the locomotive back to the city. The big grey horse chosen to cast ridicule on the clat-



THE RACE.

tering mechanism sprang away on the instant, and speedily obtained a lead of about a quarter of a mile. Finally the engine got up enough steam to move ahead and thereafter gained slowly on its competitor until at last, after several miles, the passengers on the railroad car had the satisfaction of overtaking the wagon on the other track. The driver of the horse lashed his steed furiously, and the fine animal, making a still greater effort, actually dragged its burden for a time at a speed equally as great as that shown by the steam engine, but finally began to slowly lag behind. Then the locomotive had the misfortune to drop a leather band off one of the wheels and lost its momentum, the horse forged ahead, and won the race.

Gradually, however, steam was generally adopted as motive power, and various types of locomotives were constructed, with a view to greater speed and capacity. The wooden and

iron capped rails were replaced by solid metal, sleeping cars of a sort were built and step by step, improvements were made along the various lines, although no semblance of regularity was maintained in the running of trains. A passenger on a train never knew when he might reach his destination, and a person who was waiting for a train along the line never knew when it would get there. A "brigade" of cars would depart from its starting point at some given hour, provided conditions were favorable, but after it disappeared in the distance nothing would be known of its adventures until it came back again next day. The employees at other places along the line knew when the train was theoretically supposed to start from the end of the road, but made no rash predictions respecting its visits elsewhere.

One of the first methods to discover approaching trains was the setting up of look-out masts at the various stations, and when the time arrived at which a train might perhaps be expected if nothing had befallen it, the stationmaster at that point would climb to the top of the pole by means of ladder-like cleats, take his seat in a little chair at the top of the pole, and then peer down the track through a spy glass. He would so continue to gaze for half an hour, or an hour or two hours, as the case might be, or until he got tired and then came down to earth again. If, at last he d'd detect the smoke of an approaching engine, he shouted the glad news to the waiting people below, and thus they knew the train would probably be there within the next five, ten or fifteen minutes. If by any chance knowledge had reached the station through a pedestrian or stage coach that something had happened to the train, a flag of some particular color was attached to the signal pole. By previous arrangement the meaning of such flag was understood by all patrons of the line, and so the news was heralded abroad.

A railroad company often announced the hoped for movements of its trains in the advertising columns of the newspapers, but all the inhabitants of any town which boasted of a railway understood the circumstances governing its operation and knew when its trains expected to start as well as they knew any other fact of local consequence.

About the year 1847, when business on a number of the principal roads had increased to such an extent that several trains a day in each direction were demanded, such roads began to issue regular printed schedules for the benefit of their patrons. Sometimes these printed announcements were in

the shape of small pieces of cardboard, and others were on large sheets of paper called "broadsides." When issued in broadside form the time tables were displayed in the post offices, hotel lobbies, theatres, court houses and other public buildings.

The first line of electric telegraph was built in 1842 but was used for commercial purposes only. When Morse, the inventor, came forward with his instrument, it was considered by the public to be a "nice toy," but law-makers were sceptical as to its utility. A member of the Government before whom Morse gave his demonstration, afterwards wrote this statement about the attitude of himself and other members.

> "I watched Morse's countenance closely to see if he was not deranged. He apparently was not, but I was assured by others after we had left the room that they had no confidence in the contrivance."

Their scepticism, however, soon after vanished, and the Government appropriated sufficient funds to build a trial line.

It was not, however, used in connection with railway operation until 1851. Its usefulness for this purpose was apparently not considered before that time. One day the superintendent of a certain railway happened to be riding on a train and was in a hurry. On arrival at the station at which a train in the opposite direction was to be met, and after waiting a considerable length of time, and the other train not yet being in sight, he conceived the idea of using the telegraph to see if it had left the next station. On learning that it had not, he determined to change the meeting point on this occasion and sent the following message to the operator at the next station:—

> "To Agent and Operator Goshen,
> Hold the train for further orders."

He then wrote out an order to the crew of the train on which he was riding as follows:—

> "To Conductor and Engineer of Day Express.
> Run to Goshen regardless of opposing trains."

When this was handed to the engineer, it met with instant opposition. "Foolish. Whoever heard of such a thing?" He refused point blank to leave the station, notwithstanding threat of instant dismissal, and asked the official pointedly: "Do you think I'm a fool to risk my life like that?" The upshot of the controversy was that the superintendent ran the

engine to Goshen and the engineer rode in a coach where he would be as far away as possible when the shock came. When the train arrived at Goshen the opposing train was not yet in sight; the same performance was gone through and the superintendent's train advanced to the next station, and on arrival at that point was further advanced to the next. This was the first train order and was, as you will have noted, what is now called a "single order" each train or operator having to be given a separate and differently worded one. Such orders were used for a long time. Today the socalled "Double order" system is used exclusively whereby any order affecting two or more trains is given to all in exactly the same words thus greatly reducing the train despatcher's responsibility.

The use of the telegraph on other railroads for railway operating immediately followed and the lookout pole became extinct. This naturally resulted in reducing delays to trains at meeting points. Formerly a regular meeting point was decided upon and certain trains met there when they arrived. If one of the trains sustained an accident or delay of any nature, it simply meant that the other train would have to wait, and if it did not have to wait over an hour or so it was fortunate. One day a traveller who wanted to go to the next town, wandered over to the station a couple of hours after the eastbound train was scheduled to pass, to see what the prospects were for its arrival, and to his amazement saw it approaching in the distance. Hurrying to the agent, he said "Your trains are doing better, Joe," this one is only a few hours late." Oh! said the Agent, calmly. "This is the train due day before yesterday — Yesterday's train may be along later."

One exasperated traveller, who had been waiting at a station several hours, finally reached the end of his patience and strolled into the station demanding testily of the agent "What's the use of this railroad having a schedule, the trains never run on it?" The agent, surprised at such ignorance, replied, "Why, we must have schedules, otherwise how would we know how late the train was?"

As railroad building progressed and the small lines, some of which were only a few miles in length, were joined together, many difficulties were encountered, the more important being the different track gauges. The early railroad was built as a matter of convenience to some town or locality; its cars were made to suit the owners, having in

mind also the desirability of having them of a different width from those of the next adjoining line so that they would be distinctive and could not be handled on the tracks of their competitors. As late as 1866 there were no less than 12 different gauges in use, varying in width from four feet, three inches to six feet.

For about twelve years or more after the introduction of railroads there was no method by which the conductor, who was then called the "Captain," could communicate with the engineer. It soon became evident that this would frequently be desirable, and so it came about that the men employed on the trains devised the first Code of Railway Signals, but which were, for a long time, very crude, as of course the steam whistle was then unknown. For instance the cars on some of the roads were equipped with ladders by which the Captain might climb to the top of the train and there shout to the engineer or throw something at him to attract his attention. If he did thus succeed in letting the Engineer know he wanted to talk, the engineer would stop the train and find out what the trouble was. Another method was the hoisting of a flag on a pole on the engine, the position of the flag indicating the nature of the message.

The acquiring of supremacy by the Captain over the balance of the crew was a gradual process, and depended upon various conditions. An instance: A certain train was in charge of a captain, names Ayres, and an engineer named Hamil. The latter happened to be a stubborn chap, who did not take those frequent backward glances over his brigade that were necessary for men performing such duties. One day Ayres, wanting to stop the train, and having no means of doing so, conceived a plan for future occasions. He bought a ball of strong twine, and by means of staples, carried the rope from the rear, along the roofs of the intervening cars to the engine, and attached to that end a stick of wood such as was used in the locomotive furnace. This was done in the absence of the engineer. When the latter arrived, Ayres explained the system saying that if he wanted the train to stop he would yank on the string which would cause the stick of wood to be lifted from the floor of the engine, and fall back with a thump. Later on Ayres decided to test his contrivance, but there was no result, and when the train had arrived at its destination, he found the string had been cut off the stick. The engineer upon being questioned told Ayres that he proposed to run the train without any interference

from him or anyone else. Next day Ayres again tied the string to a piece of wood, and said to the engineer. This thing has got to be settled one way or the other, if that stick is not on the end of the string when we get to Furners, you've got to lick me, or I'll lick you.'' Ayres' signals during the trip produced no response, and when the train came to a stop, he ran forward and found the string had again been cut. He immediately jerked off his coat, climbed up on the engine, knocked the engineer off the machine, jumped down after him, and the desperate fight that followed decided once for all, on that railroad, at least, who was in charge of the train.

With the increased number of trains operated, and at greater speed, the Government and the Railways began to see the need of a more complete set of rules to enable them to operate the trains and carry on their business with less danger to the public. The first Code of Rules adopted was crude, but no doubt suited conditions then existing. One of the rules stated that:

''The engineer must invariably start with care, and see that he has the whole of his train before he gets beyond the limits of his station. He must always run on the supposition that at any station he may find a *train out of place.*

If a train ''got out of place'' today the crew would likely be in the Superintendent's office the next morning. but in those days it did not appear to be a very serious offence since the rules provided the possibility of such an occurrence.

With the completion of a number of important Railways in the United States, it became apparent that it would be to their mutual advantage for the different lines to get together and arrange their train service so that there would be, at least, a semblance of connections between the arrival time of a train at the end of one line, and the departure of a train on the adjoining line. To meet the need ''The General Time Convention'' was organized in 1872, and a similar organization called the ''Southern Railway Time Convention'' a little later. These were afterwards consolidated under the name of ''General Time Convention'', which was succeeded by the American Railway Association of today. The object was ''to decide upon the dates on which general change in time shall take effect, and other matters of mutual interest in reference to Time Tables.—To facilitate the interchange of views, and the compilation of information respecting the most efficient methods by which railway lines are ,or may be operated, and

to formulate recommendations respecting uniform rules for conducting of same."

Each Railway Company was represented by its higher officers connected with transportation and traffic. When the two conventions were consolidated, one of the first matters to be considered was that of uniform rules. The existing lack of uniformity in train rules had been frequently used before juries to show that an accident upon one railway might have been prevented by the use of some rule in effect on some other railway. A Standard Code of Rules was drawn up, but railroads could accept them or not as they saw fit. A revised code was adopted, but only after a great deal of controversy. The number ng of trains proved to be quite a snag. The proposal that those in a certain direction be given even numbers, and those in opposite direction odd numbers was objected to. It was claimed by some to be impossible to carry this out, as a train starting from a terminal with an even number, would have to take an odd number should the railroad take a turn and run in some other direction. It was however decided later that railroads would be considered as running generally east and south or west and north, and that in the east bound or southbound direction trains would be given even numbers, and in the westbound or northbound direction odd numbers.

The Code of Rules, as finally adopted, was surprisingly similar to those in use today. One of the rules, however, read as follows:

> "Passenger trains must not display signals for a following train without an order from the Superintendent, nor freight trains without an order from the *Yardmaster.*"

I wonder what a train despatcher of today would think if he found three or four sections of freight trains on the road running on orders from yardmasters!

Standard time was not adopted until 1883. Prior to that time each Railroad or Community had its own time. It must have caused endless confusion, particularly to a traveller who arrived at a terminal on one railway, and proposed to continue his journey on the adjoining system when the latter was operating its trains on a time thirty or forty minutes faster than its connecting line. It is interesting to note that when standard time was finally adopted, based on the new system, the old times varied from thirty-two minutes slower to thirty-six minutes faster, a difference of over an hour. The impor-

tance of correct time was apparently of no more importance to the early railroads than to a certain Italian Sectionman, named Tony, who was promoted to the position of Section Foreman. The Roadmaster, in going over the road a few days later, came across the gang in charge of the newly appointed Foreman, and after a short conversation with the foreman, decided to put him through an efficiency test. After examining the flagging outfit, he asked him if he had a book of rules. Tony replied in the affirmative, producing same. The Roadmaster then asked him if he had a time table. Tony, reaching into his pocket, replied that he had and brought forth the time table. Roadmaster then asked him to show his watch. Tony, with a broad smile, looked at the Roadmaster and said "Me hava no watch". The Roadmaster, in amazement, asked him if this statement was correct, and that he really had no watch, to which Tony replied "Yees, me hava no watch; me hava da time table — no needa da watch."

Tony evidently had a high opinion of his time table.

To the majority however a railway time table is nothing more than rows of figures opposite stations showing the time trains are supposed to be there, and the officers responsible for their compilation are frequently complimented upon their works of art by having them referred to as foolish contraptions gotten up for the sole purpose of puzzling the people.

You may have heard the story about the sympathetic old lady who one day saw a guard in charge of a demented person, and on enquiring what his particular delusion was, was told by the guard "Why this poor nut thinks he can understand a railway time table."

All the critics are not found outside the circle of railway men either, but I venture to say that none of these realize the complication and difficulties to be met in connection with the building of time tables for any large system. Certain it is that very few, except those upon whose shoulders the duty falls, have the slightest conception of the enormous amount of detail, the checking and re-checking that go with the preparation:

1st. of the employees' time table which is necessary for the safe and efficient operation of passenger and freight trains.

2nd. The public time table for the information of travellers. It comprises the complete folder for general use, the divisional and suburban folders, separate editions for Europe, Australia and the Orient, as well as one for

distribution in the United States. The latter is printed in the United States from shells made by Canadian printers and forwarded to the printers there. These shells are made by dipping the type in a certain solution, and through an electric process a film is formed on the type which is an exact duplicate of same. This is afterwards peeled off and an electrotype made from it.

It is most important that the public time table be correct, but in the case of the employees' time table this is absolutely essential, for, in addition to providing even distribution of speed, it must show where the different regular trains are to meet when on time, where a superior train will go by an inferior train, what standard of time applies, where the trains shall stop on flag or otherwise, special instructions to be followed en route, and a myriad of other details. The public table must contain sufficient information to enable a traveller to figure out through connections, on what trains he can get a bed, parlor car seat, or a meal, and the many other features essential to an enjoyable journey. The history of the preparation of public time table could be the most intelligently presented by a passenger official, and I will, therefore, confine my remarks to the employees' time table.

In the following discussion I naturally will have the Canadian Pacific Railway in mind, but no doubt the procedure is much the same on all large systems. Right here I might mention, in order that later references may be properly understood, that the Canadian Pacific on its Eastern and Western Lines comprises eight General Superintendents' Districts, and these are divided into a total of thirty Superintendents' Divisions. That part of a division extending between two terminal points is called a subdivision.

As there is more extensive train service in the summer than in the winter it is the usual practice to have a general change of time tables in the spring and again in the fall, but alterations in service necessitate revision in certain localities at any time.

Preparatory to a general change of time, officers of the Passenger Department work up a skeleton of the service they consider necessary or desirable to adopt, based upon previous train performance, and future prospects, working in conjunction with officers of the Operating Department, and at the same time arranging with connecting lines with respect to through services, and train connections.

After the principal trains have practically been decided upon general time table meetings are held between the different interested departments, for the purpose of fixing the time for the various trains at important centres, the allotting of time between Districts, the make-up of the passenger trains, dining, cafe and sleeping arrangements, the handling of mail, express and other auxiliary services. In allotting the time between Districts, as is later done between Divisions and Subdivisions, it is endeavored to provide as even a division of time as possible, bearing in mind the number of stops to be made, the physical features of the road, connections with other trains, etc. Very often, in order to make a certain connection or time arrangement, even if the necessary change is not great, it will cause a readjustment of the schedule half way over the Continent.

Then follow similar meetings at the headquarters of the various Districts, to arrange for the distribution of time between Divisions, and the settlement of other details affecting the District as a whole.

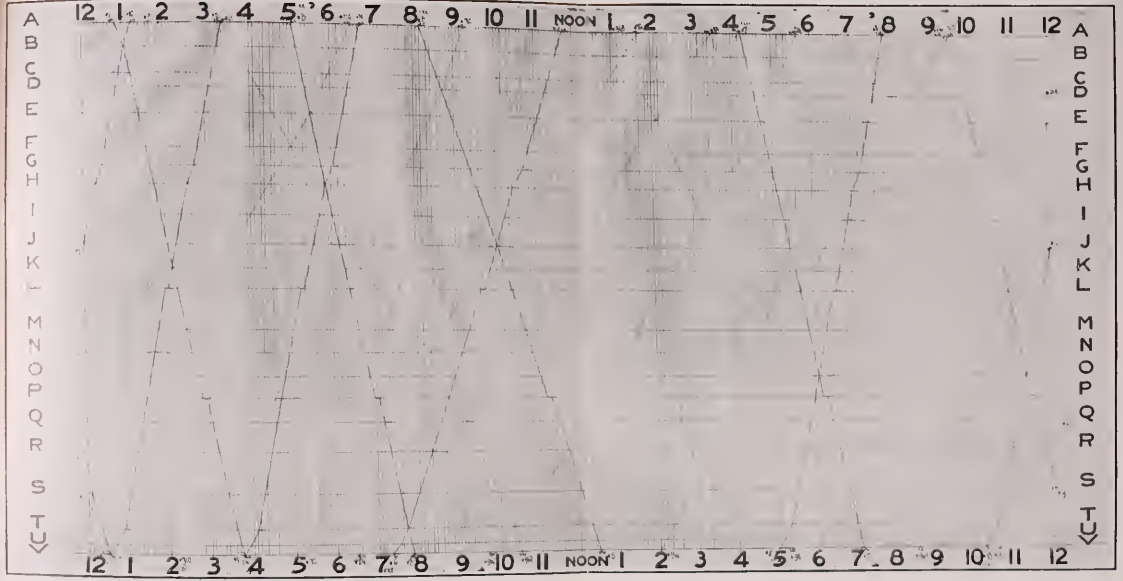
We now come to the Divisions, where again meetings are held for the purpose of distributing the time between Subdivisions and arranging other local matters.

After that the bulk of the work devolves upon the Despatchers' offices, working of course under the direction of the Superintendents, and we will endeavour to explain the procedure of the actual time table preparation.

A chart, such as you see here, is seldom used for making time tables on branch lines, and not always on main lines. If traffic is comparatively light it is not necessary. Where it is not used the distribution of time is figured out by men who are thoroughly familiar with the territory and the daily performance of the trains. These figures, when prepared, are checked over the same as though they were taken from the chart, but it has been my experience that a far more satisfactory distribution can be made by the use of the chart, and you then have the satisfaction of knowing for a certainty that all meeting and passing points are definitely fixed, and none can be overlooked. You can imagine the chagrin of one who has placed his final "O.K." on the time table proof, and forwarded same to the district headquarters for handling with the printer, to be told that he has not provided a meeting or passing point for two or more trains. This is possible without the use of a chart.

As to the chart. The horizontal lines represent the

stations, which are designated by large letters at the end, and these are spaced according to scale—that is, in proportion to




thread to 12.52. From that point there are no grades of any

After the principal trains have practically been decided upon general time table meetings are held between the differ-

quarters for handling with the printer, to be told that he has not provided a meeting or passing point for two or more trains. This is possible without the use of a chart.

As to the chart. The horizontal lines represent the

stations, which are designated by large letters at the end, and these are spaced according to scale, that is, in proportion to the actual mileage between such stations, and this must be very accurately done, otherwise it is not possible to secure uniformity of speed for the trains For instance, take stations "F" and "E", the distance between being, say five miles. If the horizontal line representing "E" were placed a quarter of an inch higher than it is, trains between the two points would be allotted possibly one or two minutes too much, while between there and the next station they would not be given enough. The perpendicular lines represent the "time", that is, as the chart covers a calendar day it is divided into 24 blocks of one hour each, and the figures along the top and bottom are the hours. The hours are again subdivided into five minute spaces for convenience in reading the train times after threads have been strung.

Now as to the actual preparation of the chart, the modus operandi of which I will endeavour to explain. On the subdivision covered by it there are five passenger trains in each direction also two freight trains westbound and seven eastbound. Passenger train No. 2 is to leave "V" at 12.30 a.m., and arrive at "A" at 3.25 a.m. A thread, held in place by a pin as shown, is placed opposite "V" in the space indicating 12.30 a.m., the thread is then drawn upwards and the other end fastened opposite "A" at 3.25. This makes a straight line between the two terminals. If the track is level and the train does not have to stop for water, or at stations, and if an average speed is maintained between terminals, the train will pass each intermediate station at the time the thread crosses each station line. Between "V" and "U," however, there is a permanent slow order of say four miles per hour, as this territory is inside city limits, a train will occupy ten minutes between these points. It is, therefore, necessary that the thread for this train, which now crosses "U" at 12.36 a.m. to be moved ahead to 12.40 a.m. and held in position by another pin. Between "U" and "T" there is a heavy grade eastbound, and a passenger train of eight or nine cars will occupy twelve minutes between these points. The thread crosses "T" at 12.48, but as it would lose a certain amount of time on the grade and would not pass "T" before 12.52, we move the thread to 12.52. From that point there are no grades of any account, and therefore the thread is left in a straight line to "L" where the train regularly stops for water. It crosses this station line at 2 a.m., but we draw it back so as to

have it arrive at 1.58 a.m., holding it in position with a pin, and then draw it across to 2.03 a.m. again holding it in position there. This shows the train arriving at 1.58 and leaving at 2.03. The two times are not necessarily shown on the time table, but the deviation in the thread admits of the train taking water and leaving that station on time. By fastening the thread at 1.58 and 2.03 results in a slight change at the preceding and following stations sufficient to take up the five minutes required for taking water. We will not interfere with the thread again until we come to "H." Between this point and the next station there is another grade which will delay the train two or three minutes, and we, therefore, give it that much additional time between these points. Over the balance of the subdivision conditions are normal and the thread is run straight.

The next passenger train is No. 4, due out of "V" at 3.45 a.m and arrives at "A" at 6.43 a.m. and this train is strung on the chart in the same method as No. 2.

The next train is No. 6, leaving "V" at 7.20 a.m., and is a local train, arrival time at "A" being 11.45 a.m. I have not attempted to allow time at any point for station work, as the method for allowing dead time has already been explained to you. It is customary, however, at more important points where a local train would regularly be delayed unloading and loading express and baggage, to provide three or four minutes dead time so that it may be on time at every point. I need not explain to you the desirability of this, not only that the train may arrive at the time advertised to the public, but also in order that the freight trains will not be delayed any more than is actually neeessary, in meeting or allowing passenger trains to pass.

The next is No. 8, due to leave "V" at 5.00 p.m and arrive at "A" at 7.50 p.m. This schedule is strung in the same manner.

The last eastbound passenger train is No. 10, leave "V" at 10.15 p.m and arrive at "A" at 1.15 a.m. You will notiee this train arrives station "J" at midnight. As the chart covers twenty-four hours only we must terminate the thread at station "J" at twelve o'clock, and commence it on the opposide side of the chart at midnight, and follow through to destination.

Now comes the stringing of passenger trains in the opposite direction, and the arranging of meeting points. Take the first passenger train No. 1, due to leave "A" 12.50

a.m. and arrive "V" at 3.45 a.m. We find that the thread crosses that of train No. 10 half way between stations "B" and "C". It is now a question whether it would be advisable to make No. 1's schedule faster between "A" and "C" and No. 10's schedule slower, as far as that point and make the meet at "C" or to make No. 1's schedule slower between "A" and "B" and No. 10's schedule a little faster as far as "B" and make the meet at that point. As No. 10 is close to objective terminal it should be given the preference, and therefore arrange the meeting point at "B." You will notice that the threads now cross at "B," and are held in position by a pin. If the threads happen to cross each other between two stations that are a long distance apart it may be necessary to go back to the next subdivision and rearrange time at the terminal, if this is possible. It probably cannot be done however without upsetting other schedules in which case some other readjustment must be made.

We now follow train No. 1's schedule through to "V" and find that it crosses train No. 2 a short distance from "K," and we, therefore, make the meet at that point, and hold the threads in position with a pin, so that both cross "K" at 2.10 a.m. From there into the terminal no alterations are necessary with the exception of water stop as shown.

The next westbound passenger train is No. 3, due leave 'A" at 5.05 a.m. and arrive "V" 7.50 a.m. We find that this thread crosses opposing passenger trains almost exactly at stations, and the meets are therefore, arranged accordingly, and the threads representing meeting time held in position as shown.

I could go more fully into details with respect to the allowance for grades, station work, etc., but have probably given sufficient to illustrate the matter. You will understand, however, that in the actual preparation of time tables this is a feature which has to be given very careful consideration.

It is customary, in preparing the chart, in order to easily distinguish between passenger trains and freight trains, to use thread of different color for each. The heavy black thread in this case therefore represents passenger trains and the green thread freight trains.

We will now touch briefly on the scheduling of freight trains.

It is not desirable to run extra trains (that is a train without any time table rights) in both directions and the usual practice is, therefore ,to run scheduled freights eastbound and

extra trains westbound. For this purpose sufficient trains are shown in the time table to provide an eastbound schedule every five or six hours, so that by running them in sections it is not necessary to run any extras or to start a regular train out of a terminal so late on any schedule that it is liable to lose its rights en route which it does, according to rule, when it becomes twelve hours late. In the opposite direction, most of the traffic is handled on extras but one or two fast freights, or a wayfreight are sometimes shown on the time table. These may, or may not be of a different class to those in the eastbound direction; that is, the eastbound may be fourth class and the westbound third class in which case the latter would have superior rights. If they were both the same class the eastbound would have preference, the rules providing first class trains as superior to second class, second class superior to third class and so on, and trains in the eastbound direction are superior to trains of the same class in the opposite direction in that the latter must, in the absence of train order to contrary, keep clear of time of the former, and at meeting points take the siding. On lines such as small branches where traffic is light the scheduling of several freights is not so important, and this is not usually done.

On this chart, as I have said before, there are nine freight trains. We need only follow one of them, and will take No. 710 leaving "V" at 2.00 a.m arriving "A" at 9.15 a.m. The thread for this crosses passenger train No. 1. half way between "S" and "R," and we, therefore, hold the train back to meet it at "S," and secure the thread in position with a pin. We then find this train overtaken by passenger train No. 4 near "P." The thread representing No. 710 is held in position 10 minutes in advance of No. 4, at that point and twenty minutes behind it. The thread is then adjusted so as to meet No. 3 at "L" and No. 5 at "C." The two times at "P" need not be transferred to the time table but the same time as for No. 4 can be shown when No. 710 will be required to arrive sufficiently in advance and follow, according to rule.

Supposing the train despatcher has another freight train to start out of "V" one hour after No. 710. He would arrange for No. 710 to carry signals over the subdivision for it, or, in other words, each freight train to be run would be handled as a section of No. 710 until the next freight was timed to leave that terminal, after which the schedule of train No. 712 would be used, and additional sections of that train run if necessary and so one.

It is unnecessary to refer to the balance of the schedule freights, the threads for these being arranged in the same manner as No. 710 and similar conditions apply to those in the opposite direction as to the passenger trains meeting opposing freights.

The chart is now complete, but it is only for one subdivision, and a similar one must be made up for the other subdivisions on each division, and the trains must be made to fit in with those on the adjoining subdivisions, also the divisions and districts with the adjoining divisions and districts, to say nothing of connections with other lines, the proper spacing of trains into large terminals to avoid congestion, the different standards of time and so on.

A blank time table (separate sheet for each subdivision) is now prepared, and the time of each train as shown on the chart is placed opposite the various stations. This draft is then sent to the printers for first proof. Upon receipt of this proof the figures are carefully checked to avoid the possibility of any errors, and if any corrections are necessary it is returned to the printers for revision. Copies of the proof are sent to District and System headquarters to be passed on before employees' time tables are finally printed. A copy is also given the Passenger Dept., to be used in connection with the public time table.

In connection with the proofs I have merely mentioned the train schedules and while these are the most important, there are many other matters that have to be taken care of, such as regular and flag stops, the days of the week on which the various trains run, special instructions to be followed, and other features too numerous to mention. For instance the times of two or more trains meeting at a station are shown in bold faced type ,as is also the case when one train passes another, and where there are one or more trains to meet, or pass a train between two times, or more than one train to meet a train at any station, attention is called to the fact by small figures showing the numbers of the trains alongside the station time. Take No. 918, for instance—this train arrives "C" at 12.45 a.m. or ten minutes ahead of No. 10. It cannot go further ahead of No. 10 nor make the next station for No. 1, consequently it has to remain at "C" for both trains. In this case two times will be shown, viz: arrival 12.45, departure 1.12, or on arrival of No. 1, and small figures 1 and 10 would be shown alongside. Where only one time is shown at a

station it is the leaving time, except at the end of the run on each subdivision when it is the arriving time.

New time tables are distributed sufficiently in advance for every employee connected with the running of trains to be in possession of a copy before it takes effect.

The switch from one time table to another in the operation of trains is very carefully safeguarded, train and enginemen giving a written receipt for time tables in addition to which the train despatcher issues a train order in which receipt is again acknowledged prior to the time of change by every train already on the road and by every new train starting from a terminal, until the signatures of all the conductors and engineers on the division shall have been received.

The usual practice is to have a change of time take effect on a Sunday at 12.01 a.m., that being considered the most convenient time from point of traffic density, and consequent slighter disturbance. Apart from some differences in the arrival and departure time of trains no one except the train despatcher, train crews, and, of course, some of the officers will notice the change of timetable, but these gentlemen are on the qui vive for any complications which may arise. Nothing more than a tie-up is likely to occur, but nevertheless they will each heave a sigh of relief when all is over and trains running on new timetable.

Chairman:

I think that I express the sentiments of all here to-night when I say that is one of the most interesting and most instructive papers that we have had the privilege of listening to. I, for one, had no idea of the complications and vast amount of work in connection with the preparation of timetables for the operation of trains. This has certainly been a most educational paper, and there are no doubt many here to-night who would like to ask questions on the subject. The paper is now open for discussion, and I feel sure Mr. Hatton will be very pleased to answer any questions that you may wish to put to him.

On page 23, Mr. Hatton refers to the first train order that was passed over telegraph wires. We have with us to-night a gentleman who, I understand, was present at the time this first telegraphic train order was given. I am sure we would all be glad if he would give us a word or two in connection with this event. Mr. Camp, may we hear from you?

Mr. W. J. Camp:

Mr. President, it is true that I am getting on in years, but

I did not know that I was as old as that. I have been very much interested in the paper given by Mr. Hatton. I notice one or two things which might be referred to. On page 20 he speaks of the figure of a locomotive or railway train being shown on whiskey bottles. I do not believe he would find any such bottles in the United States to-day to put that on. In regard to the first train order—the President has misunderstood what I said to him before the meeting. I was a member of the Association of Railway Telegraph Superintendents, which is now a part of the American Railway Association. While I was a member of that association a movement was started to erect a monument to Mr. Minot who was the Superintendent referred to as issuing the first train order. I had the honor of being a member of the committee appointed to raise funds for the erection of this monument at a station called Turner, and also had the pleasure of being present when the monument was unveiled. We had the well-known Edison there, also the widow of a former president of the railway, and a number of other prominent people. A special train was run from New York City.

I think, perhaps, Mr. Hatton is a little astray in his reference to the language by the engineer, as mentioned in his paper. My impression is that the language was much stronger than shown, but Mr. Hatton, with his usual modesty, has omitted the adjectives.

Mr. Hatton speaks about the use of telegraph in connection with train orders, but I think he has forgotten to mention one little development in connection with it and that is the use of the telephone by the principal railways. At present the main lines, and also the more important branch lines, are operated by the use of the telephone. The road I have the honor of being connected with operates its trains by telephone from St. John, N.B., to Vancouver, B.C. The Santa Fe operates entirely by telephone, also many other prominent roads in the United States.

He also speaks about the different track gauges. I happened to be in the service of the Grand Trunk when they changed their old gauge to the present gauge—I think it was between Montreal and Toronto. No doubt there are some members in the room to-night who have a recollection of this.

On page 27, Mr. Hatton speaks about standard time. I had the honor a number of years ago of reading a paper before this club on the time system as used by the C. P. R. which you can no doubt find in the records. The time is sent from a central station to all the stations on the system simultaneously,

so that there can be no question as to whether the clocks are keeping time or not. Also at divisional points on the road there are comparison clocks, and a complete record is kept of these clocks to see if they are gaining or losing time, this record being sent to the General Time Inspector. I think this system is still in use.

Although I was for a time a Train Despatcher I never had had any connection with the preparation of timetables. They were prepared by others and it was my duty to see that they were carried out. I have been very much interested in the paper and in the complete manner in which these timetables are prepared. There was one thing about this chart, however, as struck me as rather peculiar, and that is it shows two trains, at about seven o'clock in the morning, as meeting at some point between stations "J" and "K" instead of at one of these stations.

Mr. A. Hatton:

That is not right—the pin has evidently slipped out. It should not be that way. (Laughter.)

Mr. W. J. Camp:

It struck me as being peculiar, after your statement that with this chart it was impossible to make a mistake.

Mr. A. Hatton:

Well—you can, of course, in a case of that kind.

Chairman:

We have with us to-night Mr. A. C. Shaw, of the Passenger Department, Canadian Pacific Railway. We would like to hear from him in connection with the Passenger Dept.

Mr. A. C. Shaw:

Mr. Chairman and gentlemen, I hardly expected to be called upon to make any remarks at this time. I was invited here by Mr. Winterrowd to answer any questions that might be put in connection with compiling the public timetables, and that is more in my line than the operation of the chart, as explained by Mr. Hatton. The compilation of the public timetables, such as folders and posters for the various stations, is a very arduous work, possibly as much as the compilation of the working timetables, as used by the trainmen. As you probably know, the public timetables are compiled from the working timetables, which are supplied by the Oper-

ating Department. They have to be put out on time and they cannot be commenced until the working timetables are completed. The working timetables have to be out ten days prior to going into effect and the Operating Dept. do not, as a rule, have them ready until the last moment. On a system like the C. P. R., where there are hundreds of trains, the work is most arduous as the public timetables have to be written up, prepared by the printers, checked and rechecked; all of which must be done in the limit of ten days' time, and I may say—and I believe this applies to other roads as well—that it is very seldom errors are discovered in these public timetables. On a system like the C. P. R., with the terminals so far apart, the working bills have to be sent from Vancouver, Calgary, Moose Jaw, Winnipeg, Toronto and St. John, N.B., to Montreal. There are corrections which have to be made after these timetables are received, and it is often necessary to make these corrections by wire. I remember getting a telegram from Vancouver altering some of the trains and this telegram contained three thousand words. The telegram was received on a Saturday morning, and the corrections were made and the folders in the hands of the public on Sunday. You can imagine the work involved when this telegram contained three thousand words and meant changing the time of practically every train on the British Columbia District. It gives you some idea of the rush work that has to be undertaken to accommodate the public. I could go on talking on this subject, but I realize it is a dry one, and I believe that Mr. Hatton has given you a more interesting subject to consider. I thank you for the privilege of making a few remarks. (Applause.)

Mr. W. J. Camp:

Mr. Shaw speaks about a three thousand word telegram, but he did not say that there were any errors in it.

Mr. A. C. Shaw:

From my recollection, we never found any errors in that telegram. If there had been any errors the public would no doubt have discovered them when the folders were issued.

Chairman:

We also have with us to-night Mr. J. J. Connolly, Superintendent of the Grand Trunk. We would like to be favored with a word or two from him.

Mr. J. J. Connolly:

Gentlemen, this is entirely unexpected, and rather unkind

on the part of your President in not giving us some notice that we would be called upon to speak. I have listened with interest to what Mr. Hatton has said on the preparation of timetables, and was very much interested in learning that the practice followed on the Canadian Pacific is practically the same as the method followed by the Grand Trunk and many other roads. On the Grand Trunk Eastern Lines, however, we do not use a chart in the preparation of timetables, principally on account of having double track facilities. (Laughter and applause.) I notice a number of our engineers are pleased with that remark.

I was also interested in what Mr. Shaw said about the preparation of timetables for the public. I have nothing but kind words for the Traffic Dept., and especially the Passenger Traffic Dept., but it is a fact that we occasionally find errors in the public timetables, although not very many.

In regard to Mr. Camp's remarks about the three thousand word telegram. I am an old telegrapher byself. but I have not seen many telegrams of that size going through without something being found wrong in them.

Chairman:

I must apologize to the various gentlemen whom I have called upon to-night. It would probably have been better if I had given them some advance notice, but we have a great many here to-night whom I am sure are well able to discuss the paper and others who would no doubt like to ask questions. I hope you will make it a family affair and do not force me to call upon you.

Mr. W. J. Uren:

Mr. President and gentlemen, this is my first appearance at this club, although I was for a number of years associated with Mr. Hatton, who has given us this very instructive paper to-night, and have assisted in the preparation of a great many timetables. Mr. Shaw neglected to tell you that the delay in the Operating Dept. in getting their timetables ready is often due to the changes that the Passenger Dept. wish to make. I suppose they are not altogether responsible, as it happens that some fellow who has a cottage out on the beach wants train service and they try to accommodate him. The story about Thomas Edison—if I remember correctly, it was the same selected system as now used in the despatchers' telephone. He used an alarm clock. It was at a station called Camlachie on the Grand Trunk near Sarnia. He was "pound-

ing his ear," and had the alarm clock so fixed that when his station was called by the despatcher it would set off the alarm clock and wake him up.

With regard to the chart, it seems that quite a few errors can creep in if the pins drop out.

I do not know that I can say anything else to-night.

Mr. O. Masse:

Mr. President and gentlemen, I want to thank the President for his invitation to say a few words. I could speak more freely on the subject of despatching trains, as I am on the despatching staff of the Grand Trunk and am much more at home with that subject. I have listened to Mr. Hatton's remarks and appreciate the strenuous work involved in the preparation of timetables. I used to assist in this work on the Grand Trunk, and, as he says, one must be very accurate. I understand the chart and its preparation, with the exception of the pin dropping out, but I wish to make one exception, if you will let me, in connection with these springs or other devices to wake up night operators, on the Grand Trunk we have no chart and we have few springs.

Speaking about the chart, we do not use it in preparation of timetables, for, as our Superintendent said, we have long stretches of double track, but there is one thing I am careful about when I come to prepare a timetable and that is to time the trains so that between Montreal and Vaudreuil they will beat the C. P. R. (Laughter.) Every time I get on a Grand Trunk train (and I generally use the Grand Trunk because I want to get there quickly) it is a great pleasure to me to see us go by the C. P. R. about Dorval, and when we get to Ste. Annes it is "good-bye." (Laughter.) I can substantiate this statement by some of the people in this hall to-night, but I do not want to put up any argument. (Laughter). I thank you for the invitation and for listening to me.

Mr. H. C. Taylor:

Mr. President and gentlemen, I am somewhat modest and believe if I had known I was to be called upon I would have arranged to be called out to the telephone. I have listened to what my railroad brother has said about the Grand Trunk beating the C. P. R. It reminds me of the reference Mr. Hatton made in his paper of the race between the horse-drawn coach and the locomotive. The horse did actually win the race but it was only a temporary victory. (Laughter.) So

far as devices used by night operators are concerned. About twelve years ago I was night operator on the Grand Trunk at a place called Callander, but I do not believe that any spring or alarm clock would have kept me awake. There is not very much I can say to-night as my education has been mainly along transportation lines, but I can appreciate fully the work in connection with the timetable chart and preparation of timetables. It is an enormous task, and it seems to me that Mr. Hatton has covered the question very fully.

Chairman:

I would like to ask Mr. Hatton if any provision is made in timetables of this kind for the operation of trains on single or double track roads equipped with automatic block signals. I know on some lines that are so equipped a great many trains are run as extras.

Mr. A. Hatton:

About the only difference there would be is that on double tracks you would not have to have meeting points, but it is necessary to arrange a schedule on account of inferior class trains running in the same direction, and which have to keep clear of superior trains. On the C. P. R. we do not have any automatic block territory where train orders are not used, consequently a timetable is necessary.

Mr. Collins:

Mr. President and gentlemen, I appreciate the honor and privilege of being invited to speak to the enormous gathering here to-night. I agree that in the preparation of timetables the work is intricate and has to be carefully performed. Mr. Hatton has gone to considerable trouble to explain the details of how timetables are prepared, but he omitted to state that the timetable as shown on this chart is used only for branch lines of the system. It is much larger on the main lines where half the track is double track. (Laughter.) I am sure Mr. Masse, in speaking of the Grand Trunk trains passing the C. P. R., had reference to the trains of the C. P. R. that were moving in the opposite direction (Laughter.) from the explanation made it would appear that both trains were moving in the same direction, but I can assure you, Mr. Chairman, that such was not the case. (Laughter.)

Mr. G. T. Coleman:

Mr. Chairman, I think this subject has been pretty well

covered by the C. P. R. men here to-night. We have with us Mr. Malcolmson of the T., H. & B. I would like to hear from him.

Mr. H. T. Malcolmson:

First let me extend to the officers and members of the club the greetings of the Central Railway Club of Buffalo. As I am not a member of the Canadian Railway Club, I desire to thank you for extending the privilege of the floor to me.

Mr. Hatton's paper has been a very interesting one and I have been particularly impressed with a number of the points which he raised. For instance, on page 24 it is stated that in the old days, when a conductor or captain desired to get in communication with the engineer of his train, he would climb a ladder and throw something at him to attract his attention. Some of us will admit that there are occasions under present operation when we would like to exercise the same privilege.

I would like to know if Mr. Hatton can give us any information in regard to the graphic train sheet for use by train dispatchers. In principle it corresponds to the chart which we have before us. The movement of trains on these sheets is shown by lines drawn across the sheet which intersect the vertical lines representing the time of arrival at stations. The different classes of trains are shown in different colors and the system would appear to be practically "fool proof," since dispatchers could not very well have two converging lines approaching each other without it being vividly drawn to his attention, whereas the train sheets used for present day practice record the movement of opposing trains, on opposite ends of the sheet. This graphic train sheet was first called to my attention by Mr. F. L. Dodgson, Consulting Engineer, of the General Railway Signal Company, of Rochester, N.Y. One of its features is that delays en route stand out very prominently, due to the irregularity of the lines, a train standing at a station for any length of time being represented by an extension of the line horizontally, and this feature is one which would facilitate the checking of train sheets by officers. The sheet struck me as possessing considerable merit but I am not aware that it has been placed in service by any railroad, and possibly Mr. Hatton can enlighten us in this respect.

Mr. A. Hatton:

I am very sorry I cannot give any information on the graphic train sheet, as I have never come in contact with it. I

have heard of it, but could not speak about it with any authority. The train sheet I am acquainted with is the old-fashioned one which is used generally by railways now, and on which the stations run down the centre and the time of the westbound trains is shown on one side, the eastbound trains on the other.

Chairman:

If there is no further remarks I will ask that someone propose a vote of thanks to Mr. Hatton.

Mr. James Powell:

Before that vote of thanks is tendered, I would like to say that we have been very much interested in the efficient manner in which Mr. Hatton has presented his very able paper to-night. I was going to ask a question with regard to the diagram. The pins and the threads appear to be all right so long as the trains are on time what allowances are made for engines not being on time or breaking down on the road.

I was pleased to hear Mr. Shaw speak to-night. He explained the preparation of the public timetables but did not say anything about making them so they could be more easily read by the travelling public. It seems to me it would take a Philadelphia lawyer to understand these tables in many cases.

On behalf of the club I have much pleasure in moving a hearty vote of thanks to Mr. Hatton.

Mr. A. C. Shaw:

I take pleasure in seconding that motion.

Chairman:

Before we put the motion to the meeting I would like to hear Mr. Powell's question answered.

Mr. A. C. Shaw:

I think, Mr. Chairman, you would be the one to answer about the engine breaking down.

Chairman:

No, we never figure on that—I imagine the reply of a Grand Trunk man would be the same—in fact it never happens. (Laughter.)

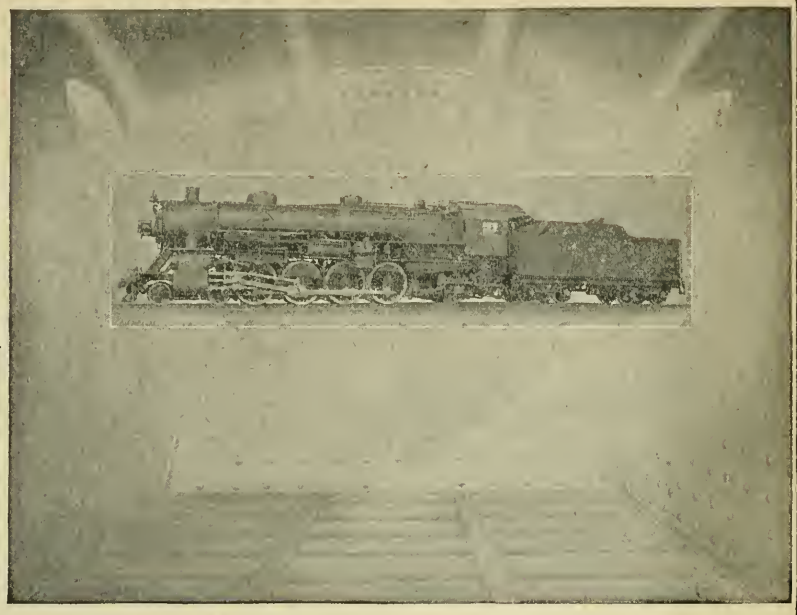
You have heard the motion. We have listened to a very fine paper and a most interesting discussion. All in favor please signify in the usual way.

Carried. Applause.

I would like before closing to call attention to the meeting in May. Everyone come and bring a friend.

I would also call attention to the coffee and sandwiches in the room at the rear, which are for all those present.

If there is no other business the meeting will adjourn.



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And they are MADE IN CANADA.

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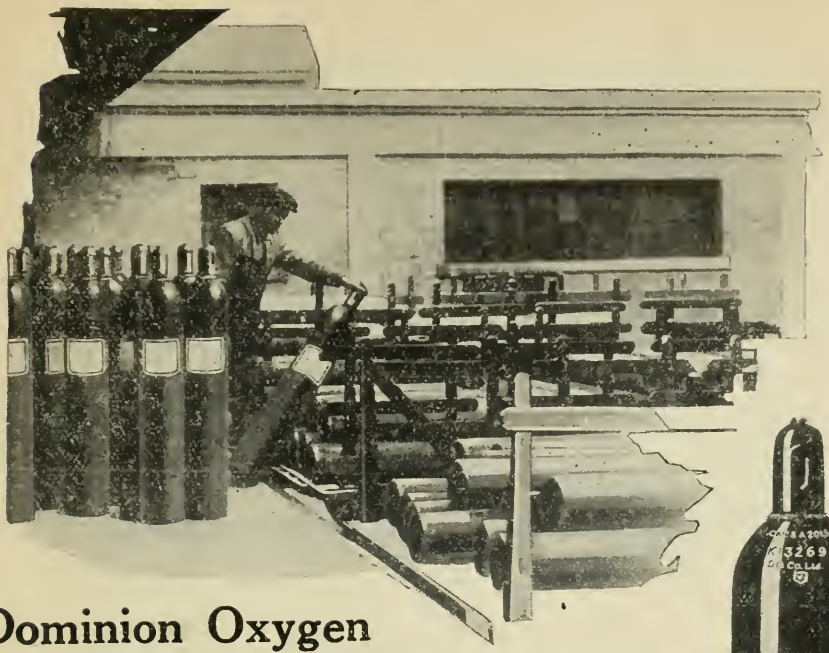
Feed Water Heaters for Locomotives.



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THE Dominion Oxygen Company, Limited, has fulfilled its promise to Canadian Industry.

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## DOMINION OXYGEN COMPANY, LIMITED

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*Perfected Through 55 Years' Experience*

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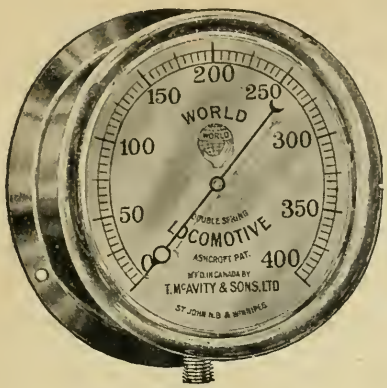


Fig. 428-150-Type DL
Size of Dial, 6 3-4 in. and 6 in.

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**Ashcroft Pat.**

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# Steam Gauges

Graduated to any pressure up to 500 lbs. Made in Iron Case with Brass Ring or in Brass Shallow Case.

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Type "E" Feed Water Heaters
**SAVE 15 Per Cent**
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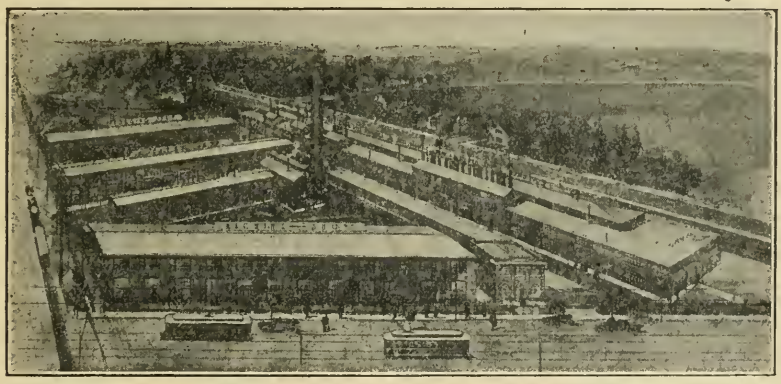

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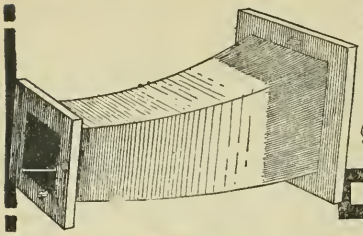

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GUARDS AND SCREENS UNNECESSARY
ABSOLUTELY SAFE, NO DANGER OF ACCIDENTS WITH THIS GLASS

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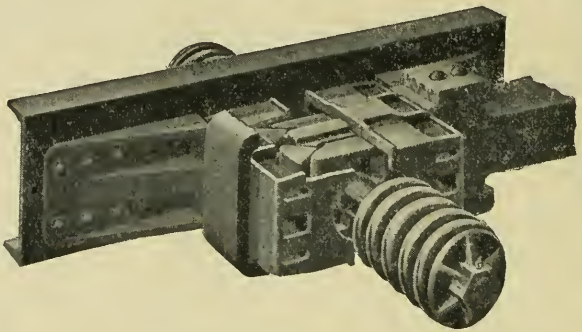

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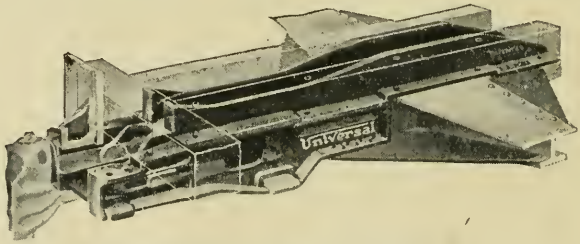


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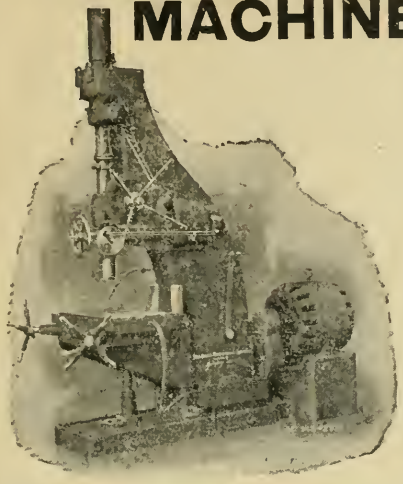

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Structural Shop Equipment

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Modern in Design and built for Heavy Duty.

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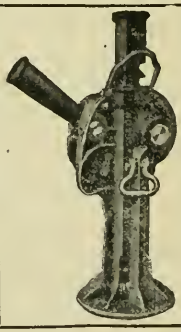

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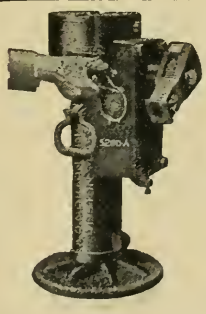

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On that basis you must figure the loss to your road for the days your locomotives are in the repair shop, or held for too frequent boiler washings, due to bad water supplies.

# DEARBORN TREATMENT

costing but a few cents per thousand gallons of water used, keeps scale from forming, and overcomes corrosion and foaming, thereby materially increasing the mileage between boiler washings, effecting large savings in repairs, reducing the fuel consumption, and eliminating many delays in operation. The life of flues and fire boxes will be more than doubled.

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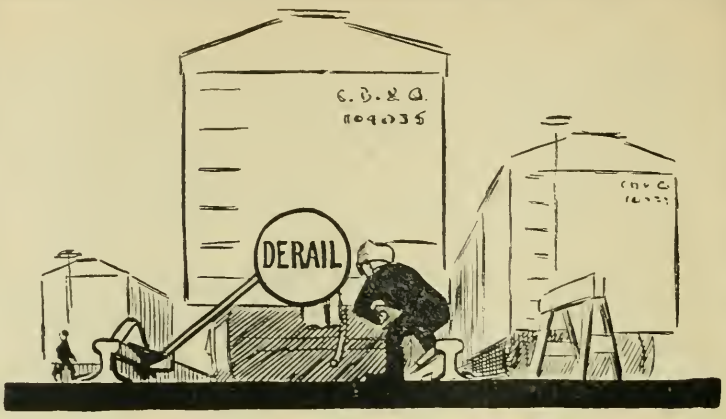


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Consider the danger in repair yards and on rip tracks—men working around and under cars without proper protection. Countless times accidents have occurred for the simple reason that a train crew has failed to observe the blue flag warning.

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